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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/990,103	11/21/2001	Yeong Suk Choi	ASIAP112	2816

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EXAMINER	
ZALUKAEVA, TATYANA	

ART UNIT	PAPER NUMBER
1713	

DATE MAILED: 07/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/990,103	CHOI ET AL.	
	Examiner	Art Unit	
	Tatyana Zalukaeva	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *6,12 and 13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 7-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-3* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-5, 9-11 stand rejected under 35 U.S.C. 102(b) as being anticipated by WO 97/00910, as per reasons of record.

3. The disclosure of WO'910 reds on the instant claims as follows:

WO'910 discloses formation of polymer nanocomposite by emulsion polymerization, more specifically formation of layered silicate intercalated with an emulsion polymer. (abstract). Layered clay minerals of WO'910 are preferably montmorillonite is composed of silicate layers with the thickness of about 1 nanometer (10 angstrom) (page 1, lines 8-10, page 3, lines 1-6). The invention provides a nanocomposite comprising a layered silicate intercalated with an emulsion polymer (page 1 second paragraph from the bottom, page 2, lines 9-11). A process for making a nanocomposite comprises forming a dispersion of a layered mineral (montmorillonite) in water, including onium salt (reads on emulsifying agent of the instant claim 1), adding a polymerizable monomer(s), such as olefin or diene with a polymerization initiator to a dispersion, and thereafter polymerizing the monomer(s) to form a latex comprising a water and a polymer nanocomposite (page 2, lines 15-22, claim 20). It is emphasized that swelling agents (page 3, lines 7-16), such as onium salts are sometimes serve as emulsifying agents, however, when the swelling agent is not an emulsifying agent, additional emulsifying

agents are employed, and they are those typically used in emulsion polymerization process, wherein cationic and non-ionic emulsifying agents are preferred. Some cationic emulsifiers, such as octadecyl amine, are most preferred, since they also function as **montmorillonite surface modifiers (onium ions)**. This reads on the limitations of the instant claims 1 and 9 (page 3, lines 17-25). Among preferred monomers **styrene** and acrylonitrile, as well as **butadiene**, **isoprene** are named on page 2, lines 29-32. Example 1on page 5 utilizes montmorillonite, as a layered silicate and azobisizobutyrinitrile (AIBN) as a free radical initiator.
Therefore, the limitations of the instant claims 1-5 and 9-11 are met by the disclosure of WO'910.

4. Claims 7 and 8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over WO'910 in view of Whitton et al (U.S.5,863,975).

WO'910 does not specifically disclose the emulsifiers, recited in claims 7 and 8, however, WO'910 clearly teaches the genus of onium salts that, cationic emulsifiers, such as octadecyl amine, since they also function as **montmorillonite surface modifiers. WO'910 provides a genus of onium salts of the general formula** $AM^{+}R^{1}R^{2}R^{3}R^{4}$, permutations allowed by the virtue of substitute groups of the above formula allows for substitute trimethylammonium chlorides, as per instant claim 8, therefore, WO'911 clearly motivates a person skilled in the art utilize onium salts that are active towards **montmorillonite,** and in particular those incorporating trimethyl ammonium chloride.

Polymerizable emulsifiers are known in the art of emulsion polymerization. Whitton discloses emulsion and suspension polymerization process in the presence of hectorite (scheme in col. 12), wherein besides the acrylic monomers (monomers A on scheme in col. 11, 12), the emulsifying agent presents the polymerizable emulsifier, those presented as © in col. 6, lines 25-65. Therefore, a person skilled in the art would have found it obvious, motivated by a generic teaching of WO'911 to employ a polymerizable group, as one of the substitute R1, R2, R3 or R4 in WO'910, by acyloyl groups as taught by Whitton in order to increase the affinity and interaction of emulsifying agent with silicate layer, and thus to arrive at the instant claims.

5. Claims 7 and 8 independently stand rejected under 35 U.S.C. 103(a) as being unpatentable over WO'910 in view of Ozawa et al (U.S. 5,369,166). As shown above the generic teaching of WO'910 provides suggestion and motivation to those skilled in the art to employ the onium salts that have most affinity to the silicate layers participating in polymerization.

Ozawa shows the suitability of polymerizable emulsifiers in the process of emulsion polymerization (col.5, lines 20-30), and more than that he shows the functional equivalency in usage of polymerizable emulsifiers along with those exemplified by WO'910. In the instant case substitution of equivalent compounds requires no express motivation, as long as the prior art recognizes equivalency, ***In re Fount*** 213 USPQ 532 (CCPA 1982); ***In re Siebentritt*** 152 USPQ 618 (CCPA 1967); ***Graver Tank & Mfg. Co. Inc. V. Linde Air products Co***. 85 USPQ 328 (USSC 1950).

Therefore, the combination of references renders claims 7 and 8 prima facie obvious and properly rejected under 35 USC 103(a).

Response to Arguments

Applicant's arguments filed 04/02/2004 have been fully considered but they are not persuasive. The crux of Applicants' arguments is based on the statement that WO'910 does not unambiguously discloses the use of a reactive emulsifying agent containing a functional group having affinity for the layered silicate" as specified in claim 1. Applicants, however agree that WO"910 teaches that the above mentioned swelling agents are also emulsifying agents (see Remarks, pager 5, lines 15-21). IN response to this argument, Examiner draws Applicants' attention to page 3 of WO'910, wherein it is unambiguously disclosed the use of a swelling agent as reactive emulsifying agent (see the first line of the third paragraph on page 3). The above referred swelling agents of WO'910 are onium salts described in paragraph 2 of page 3, and these salts are identical to those recited in the instant dependent claims as emulsifying agents, therefore, being identical to the claimed compounds they inherently posses the affinity to the layered silicate, as the compound and its properties are inseparable, and the identical compounds cannot have mutually exclusive properties. Therefore if the prior art teaches the identical chemical structure, the properties and characteristics applicant discloses and/or claims are necessarily present. ***In re Spada***, 911 F.2d 705,709,15 USPQ2d 1655,1658 (Fed. Cir. 1990).

Next Applicants' argument is that "even if the emulsifying agent taught by WO'910 is considered to be a reactive emulsifying agent" as specified in claim 1 (a

proposition with which Applicants disagree), Applicants respectfully submit that the WO'910 reference still does not unambiguously disclose the use of a stabilizer as specified in step (b) of claim 1. Applicants allege that Examiner interprets on and the same compound, i.e. emulsifying agent as the one serving two purposes. This is not found persuasive, because WO'910 clearly states that although "optionally of course ANOTHER emulsifying agents may be used even when the swelling agent has emulsifying properties" (see paragraph 3 of page 3). This clearly teaches the use of both the swelling agent and an emulsifying agent (stabilizer of the instant claims). WO'910 further teaches the same non-ionic agents, as those claimed in the instant claim 9.

The third Applicants' argument is that the reference does not disclose polymerizations in the galleries of silicates. According to Applicants the reference does not discuss in detail the structure of the nanocomposites (tactoid, intercalated, or exfoliated) during polymerization. In the subject invention, the reactive emulsifying agents penetrate into the galleries of silicates and attract monomers. Therefore, polymerization inside the galleries of silicates is facilitated.

In response to this it is noted that the steps of the process recited in the instant claim 1, as well as the compounds participating in the process of claim 1 are met by the disclosure of WO'910, as discussed above.
It is axiomatic that one who performs the steps of a process must necessarily produce all of its advantages. Mere recitation of a newly discovered property or **function** that is inherently possessed by the things or steps in the prior art does not cause a claim drawn to those things to distinguish over the prior art. Leinoff v. Louis Milona & Sons, Inc. 220 USPQ 845 (CAFC 1984)

It is further noted that the features upon which applicant relies (i.e., polymerization in the galleries of silicates) are not recited in the rejected claim(s). Although the claims are

interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Applicants argument with regard to 35 USC 103 rejections resides in contention that the secondary references are picked-up to cure the alleged deficiencies of WO'910 comparer to claim 1. This is not the case here, because the secondary references, each one individually were chosen for the sole purpose to show how the specific species of the instant claims taught by the secondary references fit into the generic teaching of onium salts provided by WO'910.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tatyana Zalukaeva whose telephone number is (571) 272-1115. The examiner can normally be reached on 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tatyana Zalukaeva
Primary Examiner
Art Unit 1713

June 25, 2004